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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/562,794

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Masayuki Ono

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MCDERMOTT WILL & EMERY LLP
600 13TH STREET, NW
WASHINGTON, DC 20005-3096

EXAMINER

GUHARAY, KARABI

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2889

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/562,794	Applicant(s) ONO ET AL.	
	Examiner Karabi Guharay	Art Unit 2889	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 and 23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-21 and 23 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/29/05; 7/17/06; 7/17/08</u> . | 6) <input type="checkbox"/> Other: ____. |

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The disclosure is objected to because of the following informalities: On page 11 & on Page 28 applicant recites "chemically absorbs" which is different from "chemically adsorbed" cited in claims and in specification page 17. Appropriate corrections are required.

Claim Objections

Claims 1-2 are objected to because of the following informalities: Claims 1-2 recite "the surface" it is not clear whose surface applicant are indicating by "the surface". Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7, 9-13, 15-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Duggal et al. (US 6515314).

Regarding claims 1-2 & 9, Duggal discloses a phosphor element (see Figs 1,3-4) comprising an electron hole injection electrode (anode layer 30; line 40-41 of column 4) and an

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electron injection electrode (cathode layer 50; lines 55-56 of column 4) disposed opposite to each other; an electron hole transport layer (34; line 30 of column 7), a phosphor layer (40) and an electron transport layer (42 of Fig 5; lines 39-44 of column 7) stacked in this order from the side of electron hole injection electrode toward the side of the electron injection electrode, wherein the stacked layers are sandwiched between the electron hole injection electrode and electron injection electrode, wherein the phosphor layer includes an inorganic phosphor material which forms an inorganic phosphor layer (layer 40 is made of inorganic phosphor material) in which at least one part of the surface is covered with an organic material (line 66 of column 4-line 63 of column 5).

Regarding claims 3 & 10, Duggal discloses a first substrate (20) which is a transparent substrate (lines 22- 34 of column 4) and a second substrate (encapsulating layer 60 of Fig 6; lines 60-64 of column 7) wherein the electron hole injection electrode, the electron hole transport layer, the phosphor layer, the electron transport layer, the electron injection electrode are sandwiched in this order between first and second substrate (Fig 6).

Regarding claims 5-7, 12-13, Duggal discloses that the organic material is a conductive organic material (lines 40-60 of column 5) having electron hole transporting as well as electron transporting property (lines 66-67 of column 4) and chemically adsorbed to the surface of the inorganic phosphor layer (lines 61 of column 5- line 3 of column 6 and line 53-67 of column 6).

Regarding claims 4 & 11, Duggal discloses that the inorganic phosphor layer is a fluorescent substance including a semiconductor host crystal (lines 18-41 of column 6).

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Regarding claim 15, Duggal discloses that the semiconductor host crystal includes an oxide or a composite oxide including at least one kind of element selected from a group of Zn, Ga, In, Sn and Ti (lines 18-41 of column 6).

Regarding claims 16 & 17, Duggal discloses that the phosphor element of claim 1 further includes an electron hole injection layer sandwiched between the electron hole injection electrode and the electron hole transport layer, and an electron injection layer sandwiched between the electron injection electrode and the electron transport layer (lines 1-7 of column 8).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

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evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 8 & 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duggal et al. as applied to claims 5 and 12 above, and further in view of Bentsen et al. (US 2004/0214036)

Regarding claims 8 and 14, Duggal et al. disclose all the limitations of claims 8 and 14 (see rejection of claims 5-7 & 12) , but fail to teach that the organic material of the phosphor layer comprises a conductive organic material having electron hole transporting property and another conductive organic material having electron transporting property.

However, in the same field of Organic EL device, Bentsen discloses that the organic emissive layer comprises hole transport material and also electron transport material along with phosphorescence compound (see paragraph 227) which is conventional for achieving desired current/voltage characteristics and desired efficiency, brightness and color (see paragraph 228).

Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate a conductive organic material having electron hole transporting property and another conductive organic material having electron transporting property in the organic light emitting layer of Duggal et al. as taught by Bentsen in order to achieve desired efficiency, brightness and color.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Duggal et al. as applied to claim 1 above, and further in view of Watanabe et al. (US 2002/0015859).

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Regarding claim 18, Duggal discloses all the limitations of claim 18, except for an electron hole blocking layer sandwiched between the phosphor layer and the electron transport layer.

However, in the same field of organic EL device, Watanabe et al. teach an electron hole blocking layer sandwiched between the luminescent layer and the electron transport layer (see Abstract). Watanabe et al. further teach that such hole-blocking layer improves driving stability and low power consumption nature by limiting migration of holes from the light emitting layer (Paragraph 10).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an electron hole blocking layer sandwiched between the luminescent layer and the electron transport layer, as taught by Watanabe et al. in the device of Duggal et al. since such layer will improve driving stability and low power consumption nature by limiting migration of holes from the light emitting layer.

Claims 19-21 & 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duggal et al. (US 6515314), in view of Koyama (US 2004/0207578).

Regarding claims 19-21 & 23, Duggal et al. discloses all the limitations of claims 19-21, except for a thin film transistor which is an organic TFT, connected to either electron hole injection electrode or electron injection electrode and a plurality of X-electrodes extending parallel to each other in a first direction and a plurality of Y electrodes extending parallel to each other extending in a second direction perpendicular to first direction wherein the TFTs are connected to X and Y electrode.

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Duggal discloses a plurality of EL displays arranged in a matrix to provide a large display (lines 2-6 of column 9) however, silent about the mode of driving the matrix display.

However, Koyama discloses an active matrix organic display device (Fig 5) having plurality of pixels wherein TFTs which is an organic TFT (paragraph 104) are connected to either electron hole injection electrode (anode) or electron injection electrode (cathode) and a plurality of X-electrodes (1501-1504 of Fig 15) extending parallel to each other in a first direction and a plurality of Y electrodes extending parallel to each other (1505) extending in a second direction perpendicular to first direction wherein the TFT (1506) is connected to X and Y electrode (paragraph 100). Koyama further teaches that having active elements like TFT to drive the display device provides longer light emission time and reduced powder consumption (see Abstract).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have active matrix display as taught by Koyama, in the device of Duggal et al. since such driving method provides longer light emission time and also reduces the consumption of power.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karabi Guharay whose telephone number is 571-272-2452. The examiner can normally be reached on Monday-Friday 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minh-Toan Ton can be reached on 571-272-2303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Karabi Guharay/

Primary Examiner, Art Unit 2889

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